

DO NOT BREAK THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO**QUESTION BOOKLET****SERIES III****Subjects : General English, Arithmetic, Pharmaceutical Science/Microbiology****BOOKLET SERIAL NO.****800091****Marks : 350****Time : 2½ hours**

Read the following instructions carefully before you
begin to answer the questions.

INSTRUCTIONS TO CANDIDATES

1. This booklet contains **175 questions** to be answered in a separate OMR Answer Sheet using Black Ball Pen in following three parts:
Part-A-General English : 50 questions, Part-B-Arithmetic : 25 questions,
Part-C-Pharmaceutical Science OR Microbiology : 100 questions.
2. All Questions are compulsory. **Part C is optional.** Candidates has to be opt either **Pharmaceutical Science or Microbiology.**
3. You will be supplied the Answer sheet separately by the invigilator. You must complete the details of particulars asked for.
4. Answers must be shown by completely blackening the corresponding circles in the Answer Sheet against the relevant question number by Black Ball Pen. OMR Answer Sheet without marking series/double series marking shall not be evaluated.

Example :

Supposing the following question is asked :-

The Capital of Meghalaya is-

- A. Guwahati
- B. Kohima
- C. Shillong
- D. Delhi

You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below :-

(A) (B) (C) (D)

In the above illustration, if your chosen response is alternative C i.e. Shillong, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ball Point Pen only as below :-

(A) (B) (●) (D)

WHICH IS THE ONLY CORRECT METHOD OF ANSWERING

5. Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.
6. There will NOT be any negative marking for wrong answers.
7. The Answer Sheet must be handed over to the invigilator before you leave the Examination Hall.
8. No rough work is to be done on the Answer Sheet. Space for rough work has been provided in the question booklet.

PART - A - GENERAL ENGLISH

Marks :100

Each question carries 2 marks :

Section-I

A. Give the correct form of narration from the given alternatives.

1. Ram's father said to him, "Do not be impatient about the result of your examination."
a) Don't be impatient about the result Ram.
b) Ram's father advised him not to be impatient about the result of his examination.
c) Ram's father said to Ram not to worry about the result.
d) Ram told his father about his result.
2. He said to his friends, "Let us go on a picnic"
a) He proposed to his friends to go on a picnic.
b) His friends said, 'Let us go on a picnic'.
c) His friends went on a picnic.
d) He told his friends to go on a picnic.
3. He asked John whether he knew his name.
a) He said do I know his name.
b) He said to John, "Do you know his name ?"
c) John asked his name.
d) Did John know my name ?
4. I often say to my friends, "You are all very dear to me."
a) I often say my friends are very dear to me.
b) I often tell my friends that they are all very dear to me.
c) Very dear to me are my friends.
d) Friends are dear.
5. He said, "Is he a doctor ?"
a) He asked that whether he was a doctor.
b) Was he doctor ?
c) He asked whether he was a doctor.
d) He is a doctor he said.

Section-II

B. Read the following passage and answer the questions given below choosing the correct alternative :

Your mental attitude is a great deter-

mining influence in your daily life. Begin the day with an expectant and energetic mental attitude towards your work and it will elevate and enhance all your activities. The spirit in which you regard the world and your fellow-men will be reflected back to you. When you are in the right mental attitude many things will seem to conspire and co-operate to advance your work and interests. Primarily it is your mental attitude that makes the day happy and productive, or the contrary. Make positive resolutions regarding the things you ought to do and bring every possible reinforcement to bear upon such resolutions. Assert in vigorous tones the thoughts you wish to establish as unconscious habits of your life, remembering always that while it is a great thing to conceive a great idea, it is still greater to put it into execution.

6. What plays a very important role in one's life?
a) activity b) mental attitude
c) faith d) love
7. How should one begin the day ?
a) with an expectant and energetic mental attitude
b) with a negative thought
c) with no faith and trust
d) with a bang

Choose the appropriate meaning of the words given below :

8. Conceive :
a) to admit the truth
b) to form an idea in the mind
c) to keep a secret
d) to perform a trick
9. Enhance :
a) to make to appear greater or better
b) to find enjoyment
c) anything difficult to understand
d) having one's attention completely
10. Assert :
a) to state one's opinion confidently
b) to agree to something
c) to decide the value

d) anything that is useful

Section-IV

Section-III

C. Choose the correct option to fill in the gaps.

11. He is absorbed _____ thought.
a) to b) into
c) in d) at
12. He gained advantage _____ me in the race.
a) at b) on
c) to d) over
13. He bequeathed his all _____ me.
a) in b) on
c) to d) for
14. In consideration _____ his youth, he is let off.
a) for b) of
c) to d) over
15. The tenants were evicted _____ the house for not paying the rent.
a) into b) on
c) from d) to
16. We worked _____ the night.
a) through b) throughout
c) at d) into
17. He was restrained _____ leaving his office.
a) for b) from
c) of d) upon
18. The two lines pass _____ each other at right angles.
a) through b) into
c) across d) at
19. I can explain the lesson to you, if you see me _____ the class.
a) behind b) after
c) within d) on
20. Mark the correct specifications _____ the board.
a) at b) on
c) into d) in

D. A sentence has been given in Active / Passive voice. Out of the four alternatives suggested select the one which best expresses the same sentence and mark your answer.

21. We were watching a film
a) we should watch a film
b) A film was being watched by us.
c) watching a film we were
d) we were a film watching
22. The waves are washing away the sandcastle.
a) The sandcastle washing away the waves
b) The sandcastle is being washed away by the waves
c) Washing waves away the sandcastle
d) All the waves washing the sandcastle away.
23. She taunted her husband with the memory of his early promise
a) Her husband was taunted by her with the memory of his early promise
b) Husband taunted her with the early promise
c) Early promise taunted her
d) Memory of his early promise taunted the husband
24. It was fancied by some of them that beautiful furniture would be made by him
a) Beautiful furniture made by him was fancied
b) Some of them fancied that he would make beautiful furniture
c) Fancied furniture made by him
d) Some of them made beautiful furniture

25. My pen has been stolen
a) Someone steal my pen
b) My pen being steal by someone
c) Someone has stolen my pen
d) Stolen my pen by someone

E. Choose the alternative which best express the meaning of the underlined words.

26. I cannot give countenance to such rudeness
a) encourage b) acceptance
c) order d) listen
27. Thank God, his plan to oust me went by the board.

- a) overboard b) passed
- c) failed d) obliged

28. He was hard up for new ideas to enthuse his followers.

- a) to be short of funds b) in want of
- c) be uncompromising d) favourable

29. He left his seat to make room for the old man

- a) attain distinction b) take advantage
- c) space d) make way

30. We had to surrender as our food ran short

- a) was in difficulty b) was exhausted
- c) started d) blundered

F. From the given alternatives choose the correct form of verb.

31. The illegal immigrants _____ to the police station.

- a) was taken b) were taken
- c) was taking d) taken

32. He has _____ a new house.

- a) buy b) been buying
- c) bought d) will bought

33. I _____ him several times this morning.

- a) see b) have seen
- c) seeing d) was seeing

34. Tom _____ a letter to the editor last week.

- a) write b) written
- c) wrote d) will write

35. He went around and _____ everybody what to do.

- a) tell b) telling
- c) told d) was told

G. Choose the correct meaning for the words and phrases given below.

36. 'play ducks and drakes with'

- a) squander b) steal
- c) provoke d) hides

37. 'rained cats and dogs'

- a) cats and dogs are afraid
- b) there was a heavy shower
- c) they love the rain

d) it rains often

38. 'talks big'

- a) very proud b) makes idle boasts
- c) vain d) wicked

39. 'show your teeth'

- a) threaten to fight b) divulge one's plan
- c) is neutral d) obstruct

40. Negligent means

- a) one who is careless in general
- b) some small or unimportant thing
- c) one who is careless in particular things
- d) none of the above

41. 'missed the bus'

- a) the bus left
- b) lost the opportunity
- c) was not on time
- d) make utmost effort

42. Pacifist

- a) a person who is fond of fighting
- b) a person who believes in total abolition of war
- c) a person who believes in God
- d) none of the above

43. Soliloquy

- a) something said or done at once
- b) a speech recited at the beginning
- c) speaking aloud while alone
- d) a speech at the end of the play

44. Pantomime

- a) the science of animal life
- b) dramatic performance with dumb show
- c) that which deals with words
- d) the life history of a man written by himself

45. Misogynist

- a) a lover of womankind
- b) a hater of mankind
- c) a hater of womankind
- d) a lover of oneself

Section-V

H. From the alternatives given below select the one that fits the best.

46. A person who leaves his country to settle abroad.

- a) eminent b) emigrant
- c) immigrant d) migrant

47. A place that houses historical curios.

- a) archeology b) museum
- c) temple d) ordance

48. Mental weariness from lack of occupation.

- a) ennui b) exhaustion
- c) fatigue d) depression

49. Ambidextrous refers to a person who

- a) has Vitamin deficiency
- b) can use either left or right hand equally well
- c) can do skilled labour
- d) is very hard to please

50. A place of refuge and protection from cruel treatment.

- a) prison b) exile
- c) asylum d) armoury

PART - B - ARITHMETIC

Marks : 50

Each question carries 2 marks :

51. If the area of the base of a right circular cone is 3850 cm^2 and its height is 84 cm, then the curved surface area of the cone is

- a) 11000 cm^2 b) 10100 cm^2
c) 10010 cm^2 d) 10001 cm^2

52. Find the value of 'C' for which the polynomial $2x^3 - 7x^2 - x + c$ is exactly divisible by $2x + 3$.

- a) 7 b) 21
c) -3 d) -18

53. If $x + \frac{1}{x} = 4$, then the value of $x^4 + \frac{1}{x^4}$ is

- a) 156 b) 194
c) 256 d) 360

54. If $2x + 3y = 34$ and $\frac{x+y}{y} = \frac{13}{8}$, then

- $5y + 7x = ?$
a) 82 b) 175
c) 178 d) None of these

55. The roots of the equation $5x^2 + 4x - a = 0$ are reciprocals of each other. What is the value of a ?

- a) 5 b) -5
c) 4 d) -4

56. $\log_{10} \log_{10} \log_{10} (10^{10^{10}})$ is equal to

- a) 100 b) 10
c) 1 d) 0

57. The value of $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 89^\circ \cos 90^\circ$ is

- a) 1 b) $\frac{1}{2}$
c) $\frac{1}{\sqrt{2}}$ d) 0

58. A number when divided successively by 4 and 5 leaves remainder 1 and 4 respectively. When it is successively divided by 5 and 4 the respective remainders will be

- a) 4, 1 b) 3, 2
c) 2, 3 d) 1, 2

59. $\left[16^{(-2)^{(-2)}} \right]$ equals

- a) 16^4 b) $\frac{1}{256}$
c) 16 d) 2

60. By how much does $\frac{6}{7/8}$ exceed $\frac{6/7}{8}$?

- a) $6\frac{3}{4}$ b) $6\frac{1}{8}$
c) $6\frac{3}{28}$ d) $7\frac{3}{4}$

61. Six bells commence tolling together and toll at intervals of 2, 4, 7, 8, 10 and 12 seconds respectively. In 30 minutes how many times do they toll together ?

- a) 24 b) 20
c) 12 d) none of these

62. The average score per innings of a batsman for certain innings was 21.75. In the next three innings he scored 28, 34 and 37 runs and his average thus increased by 1.125 runs. How many innings did he play ?

- a) 27 b) 28
c) 29 d) 30

63. Zinc and Copper are in the ratio of 5 : 3 in 200 gm of an alloy. How many grams of copper should be added to make the ratio 3 : 5 ?

- a) $133\frac{1}{3}$ b) $\frac{1}{200}$
c) 72 d) 66

64. 3 litres of water is taken out from a vessel full of water and substituted by pure milk. This process is repeated two more times. Finally the ratio of milk and water in the solution becomes 1728 : 27. Then the volume of the original solution is

- a) 3 litres b) 2 litres
c) 4 litres d) 8 litres

65. A shopkeeper sells milk which contains 5% water. What quantity of pure milk should be added to 2 litres of milk (containing 5% water) so that proportion of water becomes 4% ?

- a) 100 ml b) 250 ml
c) 400 ml d) none of these

66. A shopkeeper sells an item at a loss of $12\frac{1}{2}\%$. In order to gain 6% profit he must increase the selling price by Rs.92.50. The cost price of the item is

- a) Rs.500 b) Rs.450
c) Rs.550 d) Rs.600

67. In what time will the simple interest be $\frac{2}{5}$ of the principal at 8 percent per annum ?

- a) 8 years b) 7 years
c) 5 years d) 6 years

68. The difference between simple and compound interest (compounded annually) on a sum of money for 2 years at 10% per annum is Rs.65. The sum is

- a) Rs.65650 b) Rs.65065
c) Rs.6565 d) Rs.6500

69. A work could be completed in 100 days. However, due to the absence of 10 workers, it was completed in 110 days. The original number of workers was

- a) 100 b) 110
c) 55 d) 50

70. A train running at speed of 120 km/hr crosses a signal post in 15 seconds. What is the length of the train in metres ?

- a) 300 b) 200
c) 500 d) cannot be determined

71. A copper wire when bent in the form of a square encloses an area of 121 cm^2 . If the same wire is bent in the form of a circle, then the area of the circle is

- a) 121 cm^2 b) 242 cm^2
c) 154 cm^2 d) 60 cm^2

72. A bag contains 3 red, 6 white and 7 black balls. Two balls are drawn at random. What is the probability that both are black ?

- a) $\frac{1}{8}$ b) $\frac{7}{40}$

c) $\frac{12}{40}$

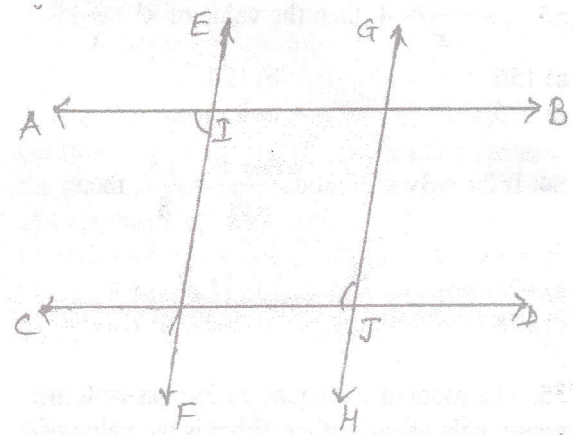
d) $\frac{13}{40}$

73. From the top of a light house 60 m high, with its base at the sea level, the angle of depression of a boat is 30° . The distance of the boat from the foot of the light house is

- a) $60\sqrt{3} \text{ m}$ b) $\frac{60}{\sqrt{3}} \text{ m}$
c) 60 m d) $30\sqrt{2} \text{ m}$

74. In the figure below, $AB \parallel CD$ and $EF \parallel GH$.

If $\angle AIF = 80^\circ$, then $\angle CJG$ is



- a) 80°
b) $\frac{1}{3}$ of a right angle
c) $\frac{2}{3}$ of a right angle
d) 100°

75. In $\triangle ABC$ and $\triangle DEF$, if $\angle A = 50^\circ$, $\angle B = 70^\circ$, $\angle C = 60^\circ$; $\angle D = 60^\circ$, $\angle E = 70^\circ$ and $\angle F = 50^\circ$, then

- a) $\triangle ABC \sim \triangle DEF$
b) $\triangle ABC \sim \triangle EDF$
c) $\triangle ABC \sim \triangle DFE$
d) $\triangle ABC \sim \triangle FED$

PART - C - PHARMACEUTICAL SCIENCE

(OPTIONAL)

Marks :200

Each question carries 2 marks :

76. Codein Phosphate is classed in Schedule

- a) C_1 b) G
c) H_1 d) X

77. Schedule 'P' specifies the

- a) List of poisons
- b) List of permitted colours
- c) Life period of Licence
- d) Life period of drugs

78. Manufacture for sale or stock or exhibit for sale or distribute of any Drugs without a valid licence is violation of section

- a) 18 (a) b) 18 (b)
c) 18 (c) d) 18 (d)

79. Powers of Inspectors as per DCAR are conferred under section

- [illegible]

80. As per DCAR, Tablets / Capsules specified in Schedule X shall be packed in doses not exceeding.

- a) 75 b) 25
c) 100 d) 50

81. In India Vaccine are tested only at

- a) Central Drugs Testing Laboratory, Kolkata
b) Pasteur Institute of India, Canoor
c) Central Research Institute, Kasauli
d) Central Drugs Testing Laboratory, Thanne.

82. The DCAR specify the Penalty for not keeping documents etc. and non disclosure of information under

- a) Section 18
b) Section 28-A
c) Rule 65
d) Rule 66

83. The minimum required area for operation of a Blood Bank for Whole Human Blood IP as per DCAR is

- a) 50 sq.m b) 80 sq.m
c) 100 sq.m d) 120 sq.m

84. A colour label shall be put on every bag containing Whole Human Blood IP. For Group 'O' blood, the colour of the label is

- a) Yellow b) Blue
c) Pink d) White

85. Alprazolam is a Schedule

- a) C-Drug b) C₁-Drug
c) H₁-Drug d) X-Drug

86. Every Drugs Inspector shall be deemed to be Public Servant with the meaning of which section of the DCAR ?

- [illegible]

87. Diseases and ailments (by whatever name described) which a drug may not purport to prevent or cure or make claims to prevent or cure are specified in Schedule

- a) C b) F
c) G d) J

88. A drug shall be deemed to be spurious as per DCAR

- If it is coloured, coated, powdered or polished to conceal the damage or if it is made to appear better or of greater therapeutic value than it really is
- If it consists in whole or in part of any filthy, putrid or decomposed substance.
- If it has been substituted wholly or in part by another drug or substance
- All the above

89. The DCAR stipulate requirement of premises, plant and equipment for Pharmaceutical products for GMP in schedule

- a) F b) M
c) P d) Q

90. The Chairman of the Drugs Technical Advisory Board is the

- Drugs Controller General of India
- Director General of Health Services
- Director of Central Drugs Testing Laboratory
- President of Pharmacy Council of India

91. Conventional unidirectional airflow system where Grade-A condition is required to have a guidance airflow velocity of

- a) 0.72 to 0.80 m/s
- b) 0.36 to 0.54 m/s
- c) 0.22 to 0.46 m/s
- d) 0.17 to 0.57 m/s

92. In the manufacture of sterila preparation the maximum permitted airborne particle concentrate (per m² greater than or equal to the tabulated size) for Grade B. [Choose (a) or (b) or (c) or (d)]

	At Rest		In Operation	
	0.5 μ m	5.0 μ m	0.5 μ m	5.0 μ m
(a)	352000	2900	3520000	29000
(b)	3520	29	352000	2900
(c)	3520000	29000	Not defined	Not defined
(d)	3520	20	3520	20

93. The Licence issued for operation of a Blood Bank is signed by

- a) State Licensing Authority
- b) Central Licensing Approving Authority
- c) Chief Medical Officer
- d) Both (a) and (b)

94. Certificate of test or analysis by Government Analyst U/s 25(1) of the DCAR is issued in Form

- a) 10
- b) 11
- c) 12
- d) 13

95. The Government Opium factory is situated at

- a) Ghazipur
- b) Lucknow
- c) Srinagar
- d) Kolkatta

96. Which of the following Medical devices has not yet been notified as drugs ?

- a) Cordiac stent
- b) Disposable Hypodermic Syringe
- c) Intra Ocular Lenses
- d) Clinical Thermometer

97. Sale of which of the following category of drugs do not require a drugs licence ?

- a) Ayurvedic drugs
- b) Homeopathic drugs
- c) Both (a) and (b)
- d) None of the above

98. Adduce of evidence when aggrieved or not satisfied with the test report of the Government Analyst is permitted under which section of the DCAR ?

- a) 25-A
- b) 25-B
- c) 25-C
- d) 25-D

99. In public interest the Central Government is empowered to regulate, restrict or prohibit manufacture etc. of drugs and cosmetics under which of the following sections of the DCAR ?

- a) 26-A
- b) 26-B
- c) 26-C
- d) 26-D

100. As per DCC Guidelines, "Liquid preparations sharing presence of fungus" is a defect categorised in category

- a) A
- b) B
- c) C
- d) None of the above

101. As per DCC Guidelines, "Broken or Chipped tablets" is a defect categorised in category

- a) A
- b) B
- c) C
- d) None of the above

102. In a Blood Bank, the Pilot tube of a blood bag is to be preserved for how many days ?

- a) 5 days
- b) 6 days
- c) 7 days
- d) 8 days

103. Dispensing of Drugs by unregistered person is prohibited under what section of the Pharmacy Act 1948 ?

- a) 40
- b) 41
- c) 42
- d) 43

104. Subsequent registration of registered Pharmacist registered in another state is permitted under what section of the Pharmacy Act 1948 ?

- a) 32 (a)
- b) 32 (b)
- c) 32 (c)
- d) None of the above

105. One Registered Pharmacist to represent each state Government to the Pharmacy Council of India is nominated under what section of the Pharmacy Act 1948 ?

- a) 3 (h)
- b) 4 (h)
- c) 5 (h)
- d) 6 (h)

106. As per PPR-2015, the punishment for giving the Pharmacist Registration Certificate at more than one pharmacies is

- a) Fine upto five hundred rupees
- b) Imprisonment upto six months
- c) Removal of name from the register
- d) Both (a) and (b)

107. What type of substances are alkaloids?

- a) Acid
- b) Neutral
- c) Chemical
- d) Basic nitrogen

108. The most abundant protein in the human body is

- a) Myosin
- b) Albumin
- c) Hemoglobin
- d) Collagen

109. The pore size range of membrane filter is

- a) 0.15-0.35 μm .
- b) 0.22-0.45 μm .
- c) 0.50-0.75 μm .
- d) 0.35-0.55 μm .

110. Which of the following statements is accurate in explaining why Gram -ve bacteria are generally more resistant to penicillin than Gram +ve bacteria ?

- a) Gram -ve bacteria have a thicker wall
- b) Gram -ve bacteria have outer hydrophilic membrane that acts as an extra barrier
- c) Gram -ve bacteria can concentrate beta-lactamase enzyme in the periplasmic space.
- d) Gram -ve bacteria produce smaller quantities of transpeptidase enzyme.

111. Blood should not be stored below 2°C because

- a) Platelets get clumped
- b) Fragility of WBC is increased
- c) Increases chances of infection
- d) Causes hemolysis

112. Which of the following anticoagulants may colour the urine orange or reddish ?

- a) Heparin
- b) Warfarin
- c) Phenindione
- d) Diphenadione

113. Cholesterol is a

- a) Fatty acid
- b) Phospholipid
- c) Steroid
- d) Glycolipid

114. The process of blood clotting is initiated by

- a) Prothrombin
- b) Fibrinogen
- c) Thrombin
- d) Thromboplastin

115. Haemoglobin belongs to which class of the following proteins ?

- a) Metalloproteins
- b) Flavoproteins
- c) Lipoproteins
- d) Chromoproteins

116. Licence to operate a Blood Bank for collection and processing of Whole Human Blood and / or its components for sale or distribution is issued in prescribed form

- a) 28-A
- b) 28-B
- c) 28-C
- d) 28-D

117. Licence in form 20 and 21 are issued for sale or distribution of drugs by

- a) Retail with Schedule-X drugs
- b) Retail without Schedule-X drugs
- c) Wholesale with Schedule-X drugs
- d) Wholesale without Schedule-X drugs

118. The total number of Medicines included in the National List of Essential Medicines 2015 is

- a) 276
- b) 376
- c) 476
- d) 576

119. Which of the following medicines does not rely on topical drugs delivery ?

- a) Nasal spray
- b) Anti dandruff shampoo
- c) Insulin pen
- d) Nicotine patch

120. Which of the following is not an unsaturated fatty acid ?

- a) Arachidonic acid
- b) Oleic acid
- c) Linolenic acid
- d) Stearic acid

121. Which of the following is used for the preparation of Gripe water ?

- a) Dill
- b) Anise seed
- c) Cumin
- d) Caraway

122. Which of the following is used as adrenergic drug ?

- a) Ephedra
- b) Physostigma
- c) Pilocarpus
- d) Belladonna

123. Which of the following is not used as anti-cancer ?

- a) Podophyllum
- b) Curare
- c) Camptotheca
- d) Taxus

124. Which of the following Vitamins is called "Anti egg white injury factor"?

- a) Biotin b) Tocopherols
- c) Ascorbic acid d) Vitamin K

125. Thyroid gland takes up circulating iodine by

- a) Simple diffusion
- b) Facilitated diffusion
- c) Active uptake
- d) In exchange for chloride

126. Disintegration time for dispersible tablets is within

- a) 2 min b) 10 min
- c) 3 min d) 15 min

127. Talcum powders are most effectively sterilized by

- a) Autoclave b) Dryheat
- c) Gas sterilization d) Millipore

128. Moist heat sterilization is done for

- a) Ophthalmic preparations
- b) Stoppers
- c) Normal saline
- d) All the above

129. In Dry heat sterilization, which of the following conditions can be maintained ?

- a) 160° C for 2 hours
- b) 170° C for 1 hour
- c) 300° C for 1 minute
- d) All the above

130. As per GMP, permitted limit of solid content in water for injection is

- a) 100 ppm b) 1.0 ppm
- c) 0.1 ppm d) 10.0 ppm

131. According to stokes law the creaming of emulsion is indirectly proportional to

- a) Density of medium
- b) Opacity of medium
- c) Resistance of medium
- d) Viscosity of medium

132. Which one of the following conditions generally increases the rate of drug-dissolution from a tablet ?

- a) A decrease in the surface area
- b) An increase in the particle size
- c) Use of the ionised form of the drug
- d) Use of the unionised form of the drug

133. The iron stored in intestinal mucosal cells is complexed to

- a) Ferritin b) Intrinsic factor
- c) Transcobalamine d) Transferrin

134. Creatinine clearance is used as a measurement of

- a) Renal excretion rate
- b) Glomerular filtration rate
- c) Active renal secretion
- d) Drugs metabolism rate

135. Iodine number denotes

- a) Degree of unsaturation
- b) Saponification
- c) Acid number
- d) Acetyl number

136. Diphenyl hydramine is an

- a) Amino alkyl ether b) Amino alkyl ester
- c) Amide d) Amine

137. Which one is an example of azo dye ?

- a) Amaranth b) Brilliant green
- c) Crystal violet d) Phenolphthalein

138. Which of the following is a tetracycline ?

- a) Chloramphenicol b) Doxycycline
- c) Erythromycin d) Streptomycin

139. The general structure of tetracycline is an octahydro analogue of which of the following in which a number of substituents are possible ?

- a) Naphthalene b) Naphthacene
- c) Anthracene d) Phenanthrene

140. When Phenol is treated with chloroform and aqueous sodium hydroxide, salicylate is formed. The reaction is known as

- a) Reimer - Tiemann reaction
- b) Clemmensen reduction
- c) Kolbe reaction
- d) None of the above

141. Moderately coarse powder are indicated by sieve number

- a) 10/44 b) 22/60
- c) 20/60 d) 44/85

142. Effervescent granules are used as

- a) Lubricant b) Analgesics
- c) Antacids d) Astringent

143. The onset time for a drug given orally is the time for the drug to

- a) Reach the peak plasma concentration
- b) Reach minimum effective concentration
- c) Begin to be absorbed from small intestine
- d) Begin to be eliminated from the body

144. In the oral treatment of Iron-deficiency, iron is preferably administered as

- a) Ferrous iron
- b) Ferric iron
- c) Elemental iron
- d) All the above

145. The therapeutic index of a drug is a measure of its

- a) Safety
- b) Potency
- c) Efficacy
- d) Dose variability

146. Which of the following antibiotics is a macrolide ?

- a) Chloramphenicol
- b) Doxycycline
- c) Erythromycin
- d) Streptomycin

147. Hyperthyroidism is also known as

- a) Grave disease
- b) Myxoedema
- c) Adrenal carcinoma
- d) Chron's disease

148. Normal value of bleeding time is

- a) 2-9 minutes
- b) 3-7 minutes
- c) 4-9 minutes
- d) 5-6 minutes

149. Acute toxicity of arsenic is manifested by

- a) Garlic odour in breath
- b) Hypertension
- c) Sedation
- d) Euphoric

150. Anti malarial Drug that is very important for medical cure of relapsing vivax is

- a) Chloroquin
- b) Pyrimethamine
- c) Primaquin
- d) None of the above

151. Besides the gastrointestinal tract the most common site of infection with coliform bacilli is

- a) Upper respiratory tract
- b) Lower respiratory tract
- c) Urinary tract
- d) Colon

152. Unpleasant flushing of face occurs if alcohol is taken along with

- a) Tolbutamide
- b) Glibenclamide
- c) Chlorpropamide
- d) Metformin

153. In duodenal ulcer therapy antacids are best given

- a) 1-2 hour after food
- b) 1-2 hour before food
- c) Along with food
- d) At any time

154. Which of the following anti platelet drugs has been shown to decrease the incidence of stroke often transient ischemic attack ?

- a) Clofibrate
- b) Dipyridamole
- c) Aspirin
- d) Sulfasalazine

155. Glycolytic pathway is the

- a) Conversion of pyruvic acid into oxaloacetate
- b) Degradation of glucose into pyruvic acid
- c) Successive oxidation-reduction reaction involving succinate NADH
- d) None of the above

156. Pick up the Non-essential amino acids from the following

- a) Tyrosine
- b) Phenylalanine
- c) Lysine
- d) Threonine

157. Vaccines contain

- a) Antibodies
- b) Antigens
- c) Toxins
- d) None of the above

158. When used as sterilizing agent, Gamma radiation kills the micro-organisms by

- a) Oxidation of essential cell constituents
- b) Denaturation and coagulation of essential cell proteins
- c) Alkylation of cell proteins
- d) Ionization of molecules of cell constituents

159. The official method for the analysis of ciprofloxacin is by

- a) Potentiometry
- b) HPLC
- c) Gas chromatography
- d) Non-aqueous titration

160. Which of the following is most effective in preventing transmission of HIV from mother to the foetus

- a) Lamivudine
- b) Zidovudine
- c) Indinavir
- d) Ribavirin

161. Bloom strength is used to check quality of

- a) Lactose
- b) Ampoules
- c) Hardness of tablets
- d) Gelatin

162. The reason for muscular fatigue is

- a) Reduced supply of O_2 in muscles
- b) High concentration of CO_2 in muscles

- c) Reduced activity of the brain
- d) Accumulation of lactic acid in muscles

163. The pigment in the rod cells of eye is called as

- a) Haemoglobin b) Melanin
- c) Rhodospin d) Iodopsin

164. In Bancroft's filariasis the choice of drug is

- a) Quinine b) Metronidazole
- c) Diethylcarbamazine d) Artimisin

165. Sugars will not exhibit electrophoresis because

- a) They are soluble
- b) They have no electrical charge
- c) They are small molecules
- d) They decompose easily

166. Methyl red shows the following colour when it is in basic medium

- a) Red b) Pink
- c) Yellow d) Blue

167. Laboratory diagnosis of enteric fever is based on

- a) Blood culture
- b) Urine and stool culture
- c) Widal test
- d) All the above

168. For increasing the excretion of weakly acidic drugs urine should be made

- a) Alkaline
- b) Neutral
- c) Acidic
- d) PH does not effect the excretion

169. The Wonder drug of second World War is produced from

- a) Algae b) Fungi
- c) Bacteria d) None of the above

170. Steroid hormones are synthesized from

- a) Adenine b) Proteins
- c) Vitamins d) Cholesterol

171. Which of the following is commonly used bulking agent in the formulation of freeze-dried low dose drug particle ?

- a) Sodium Chloride b) Mannitol
- c) Starch d) HPMC

172. 2-methyl -5 nitro imidazole -1 ethanol acts as

- a) Antimalarial
- b) It is effective for infection caused by aerobic bacteria
- c) Effective against anaerobic bacterial infection
- d) None of the above

173. Tyndallisation is a method of

- a) Intermittent sterilization
- b) Autoclaving
- c) Boiling
- d) Pasteurization

174. Rabies virus is rapidly destroyed by

- a) Thiomersal
- b) Phenol
- c) Ultra violet radiation
- d) Sulphadiazine

175. The only immunoglobulin that is transported across the placenta to reach the foetal circulation is

- a) $I_g A$ b) $I_g G$
- c) $I_g M$ d) $I_g D$

PART - C - MICROBIOLOGY

(OPTIONAL)

Marks :200

Each question carries 2 marks :

76. Each of the following statements concerning the Gram stain is correct except

- a) *Escherichia coli* stains pink because it has a thin peptidoglycan layer
- b) *Streptococcus pyogenes* stains blue because it has thick peptidoglycan layer
- c) *Mycoplasma pneumoniae* is not visible in the Gram's stain because it does not have cell wall
- d) *Mycobacterium tuberculosis* stains blue because it has a thick lipid layer

77. Antimicrobial drug combinations are aimed at achieving the following except

- a) Faster and more complete elimination of the infecting organism
- b) Treat infection when nature and sensitivity of the infecting organism is not definite.
- c) Prevent emergence of resistant strains
- d) Prevent super infection

78. Helper cells belong to

- a) T cells
- b) Macrophages
- c) B cells
- d) Monocytes

79. In HIV infection, reverse transcription describes which of the following

- a) Converting viral DNA into RNA
- b) Converting viral RNA into DNA
- c) Converting proteins into viral RNA
- d) Both (a) and (b)

80. Enzyme drug used for leukaemia treatment

- a) Dihydrofolate reductase
- b) Asparaginase
- c) Aromatase
- d) DNA gyrase

81. Bacteriophages undergo replication by

- a) Binary fission and fragmentation
- b) Lytic cycle and lysogenic cycle
- c) Both (a) and (b)
- d) None of the above

82. Common food poisoning microbes are

- a) *Clostridium* and *Salmonella*

- b) *Clostridium* and *Escherichia coli*

- c) *Escherichia coli* and *Salmonella*

- d) *Clostridium* and *Streptococcus*

83. Kuru disease in human is caused by

- a) Virus
- b) Virioids
- c) Prions
- d) Prions and virioids

84. The resolving power of an optical microscope is

- a) 0.2 μm .
- b) 0.2 \AA
- c) 0.2 nm
- d) 0.2 mm

85. The reduction of virulence of a microorganism is known as

- a) Attenuation
- b) Exaltation
- c) Inactivation
- d) Hibernation

86. The viral genome integrated to the bacterial genome is called

- a) Plasmid
- b) Prophage
- c) Virion
- d) Capsid

87. Common causes of acute urticaria include all of the following except

- a) Food allergy
- b) Drug allergy
- c) Hymenoptera stings
- d) Inhalant allergy

88. Name the process in which a cell such as neutrophil or a macrophage uses to ingest (eat) its prey

- a) Chemotaxis
- b) Botulism
- c) Phagocytosis
- d) Pinocytosis

89. The dominant pharmacokinetic feature of penicillin G is

- a) It is equally distributed extra and intra-cellularly
- b) It is rapidly secreted by proximal renal tubules
- c) It has low oral bioavailability due to high first pass metabolism in liver
- d) It does not cross blood-CSF barrier even when meninges are inflamed

90. Which one of the following is correctly matched regarding an institute and its location?

- a) National Institute of Virology-Pune
- b) National Institute of Communicable Disease-Lucknow
- c) Central Drug Research Institute-Kasauli
- d) National Institute of Nutrition-Mumbai

91. Diphtheria toxin acts by

- a) Inhibiting Acetyl choline release
- b) Inhibiting glucose transport
- c) Increasing level of cyclic AMP
- d) Inhibiting protein synthesis

92. In Rhabdoviruses, the term 'rhabdo' refers to as

- a) bread shaped
- b) bullet shaped
- c) brick shaped
- d) beads shaped

93. Staphylococcus epidermis causes an infection that can be treated with

- a) Cephalosporin
- b) Vancomycin
- c) Bacitracin
- d) Cycloserine

94. The pore size of 'introcellulose' is

- a) 0.23 μm .
- b) 0.22 μm .
- c) 0.21 μm .
- d) 0.26 μm .

95. The temperature range for 'pasteurization' is

- a) 60° C - 70° C
- b) 62° C - 72° C
- c) 65° C - 75° C
- d) 121° C - 130° C

96. Mycoplasma, rickettsiae and chlamydiae are

- a) types of fungi
- b) small bacteria
- c) species of protozoa
- d) forms of viruses

97. Rounded head of a 'tapeworm' is called

- a) Proglottids
- b) Scolex
- c) Neck
- d) Joint

98. The other name for 'pertussis' is

- a) cough
- b) cold cough
- c) whooping cough
- d) fever

99. Klebsiella, E.coli, Enterobacters and Pseudomonas are causative agent for

- a) Cancer
- b) Urinary tract infections
- c) Anthrax
- d) Peritonitis

100. Skin testing is useful in the diagnosis of which type of hypersensitivity reaction ?

- a) Type I
- b) Type II & III

c) Type IV

d) Type I & IV

101. What is a specific term for a bacterial or other foreign protein that initiates antibody production by the body ?

- a) Peptide
- b) MHC II molecules
- c) Allergen
- d) Complement

102. What main characteristic of HIV makes the virus difficult to treat with a single dose ?

- a) Its ability to destroy drug
- b) Impenetrable capsule
- c) Its ability to mutate
- d) Its environmental durability

103. 'Meningitis' is a disease of brain which is caused by

- a) Haemophilus influenzae
- b) Neisseria meningitidis
- c) Meningococcus
- d) All of the above

104. The time period during which a specific antibody develops and becomes detachable in the blood is known as

- a) Serology
- b) Blood Culture
- c) Seroconversion
- d) Antibody production

105. The phase of bacterial growth in which the bacterial parent cell does not divide but the metabolic activity is vigorous, named as

- a) Log phase
- b) Lag phase
- c) Stationary phase
- d) Death phase

106. To form cheese, a mixture of bacteria and fungi act upon

- a) fermented milk sugar
- b) lactic acid
- c) fats
- d) all of the above

107. The minimum time for doubling of E. Coli generation is approximately

- a) 1 hour
- b) 30 minutes
- c) 40 minutes
- d) 20 minutes

108. If antibodies are injected in human body for the protection against the foreign agent, the resulting immunity is

- a) Active immunity
- b) Passive immunity
- c) Defence mechanism
- d) Drug therapy

109. The process of mating through which two

bacterial cells transfer their DNA, a cell acts as a host while other as recipient, the process is known as

- a) Transduction b) Transformation
- c) Conjugation d) Mating

110. Normally DNA molecule has A-T, G-C pairing. However, these bases can exist in alternative valency status, owing to rearrangements called

- a) point mutation
- b) frame shift mutation
- c) analogue substitution
- d) tautomerisational mutation

111. Which of the following is not ionising radiations ?

- a) X-rays b) UV rays
- c) Cosmic rays d) alpha rays

112. A substance that induces unregulated growth processes in cells or tissues leading to cancer are called

- a) mutagen b) carcinogen
- c) pathogens d) Microbes

113. Immunocompromised persons suffer from several fungal diseases. Which of the following is the least frequently associated fungi ?

- a) Cryptococcus neoformans
- b) Aspergillus fumigatus
- c) Malassezia furfur
- d) Mucor species

114. Each of the statements concerning candida albicans is correct except

- a) C. albicans is a budding yeast that form pseudohyphae when it invades tissue
- b) C. albicans causes thrush
- c) C. albicans is transmitted primarily by respiratory aerosols
- d) Impaired cell mediated immunity is an important predisposing factor to disease

115. The vector for the 'Chagas' disease is

- a) Reduviid bugs b) Bugs
- c) Mosquitoes d) Fleas

116. 'Visceral leishmania' is caused by

- a) I. tropic
- b) Leishmania donovani
- c) Leishmania tropica
- d) Leishmania mexicana

117. Viruses can be isolated from clinical samples by cultivation in the following except

- a) Tissue culture
- b) Embryonated eggs
- c) Animals
- d) Chemically defined media

118. Which of the following is a primary stain for acid fast staining of mycobacteria ?

- a) Crystal violet b) Carbol fuchsin
- c) Geimsa d) Methylene blue

119. Which of the following describes the correct path of light in a compound light microscope, from the illumination source to the eye of the observer ?

- a) Condenser lenses - prism - specimen - objective - lenses - body tube - ocular lens - eye
- b) Ocular lens - body tube - condenser lens - specimen - objective lens - prism - eye
- c) Condenser lenses - specimen - objective lenses - body tube - prism - ocular lens - eye
- d) Objective lenses - specimen - condenser lenses - body tube - prism - ocular lens - eye

120. Which of the following is the necessary step for cultivating the microorganisms ?

- a) Preparing a culture medium for the growth of microorganisms
- b) Sterilizing in order to eliminate all living microorganisms in vessel
- c) Inoculating the microorganisms in the prepared medium
- d) All of the above

121. When the power of ocular lens is 10X and objective lens is 40X, the magnification is

- a) 50 times b) 40 times
- c) 400 times d) 4000 times

122. Glass vessels and syringes are sterilized by

- a) Hot air oven b) Autoclaving
- c) Irradiation d) Ethylene oxide

123. Which of these produces and secretes antibodies in the body ?

- a) Plasma cells b) Bacteria
- c) Red blood cells d) Virus

124. Virulence of a microorganisms can be best described as

- a) The ability to penetrate into the host tissue

- b) The ability to colonize in the host
- c) The ability to produce a pathological symptom
- d) The ability to utilize the machinery of the host

125. Bacteria with a tuft of flagella found at one of the cell pole is called

- a) Monotrichous b) Lophotrichous
- c) Peritrichous d) Amphitrichous

126. *Saccharomyces cerevisiae* is being grown in a chemostat converts glucose to biomass, ethanol, glycerol and carbondioxide. At steady state, the concentration of glucose, biomass, ethanol and glycerol will

- a) decrease with time
- b) increase with time
- c) be constant
- d) change randomly with time

127. Aflatoxin is produced by

- a) *Aspergillus* sp. b) *Salmonella* sp.
- c) *Fusarium* sp. d) *Streptococcal* sp.

128. Following statement is true of which of the following scientists ?

He was originally trained as a chemist, but his studies on fermentation led him to take interest in micro organisms. His discoveries revolutionized medical practice, although he never studied medicine.

- a) Robert Koch
- b) Louis Pasteur
- c) Antonyvan Leeuwenhock
- d) Edward Jenner

129. Which steroid is used for microbial transformation ?

- a) Cortisol b) Cholesterol
- c) testosterone d) progesterone

130. The use of living microorganisms to degrade environmental pollutants is called

- a) microremediation b) nanoremediation
- c) bioremediation d) all of the above

131. Which of the following media is most suitable for antibiotic sensitivity testing ?

- a) Mueller-Hinton medium
- b) Nutrient agar
- c) Blood agar
- d) Mac Conkey agar

132. For detection of carriers in enteric fever, which of the following specimens is most important ?

- a) Faeces b) Urine
- c) Blood d) Sputum

133. Polymerase chain reaction is useful in the diagnosis of which of the following infections ?

- a) HIV
- b) Hepatitis B Virus
- c) Human papilloma virus
- d) All of the above

134. ELISA kits are commercially available for detection of

- a) anti-HIV antibodies
- b) hepatitis B surface antigen
- c) Rotavirus
- d) all of the above

135. *Acidophilus* milk which is used for its therapeutic properties in intestinal disorders requires for its manufacture a pure culture of

- a) *Lactobacillus bulgaricus*
- b) *Streptococcus thermophilus*
- c) *Lactobacillus acidophilus*
- d) None of the above

136. To a living organism, which of the following has the greatest amount of available energy per molecule ?

- a) ATP b) ADP
- c) AMP d) H_2O

137. Yeast cells are good source of

- a) Vitamin A and B
- b) Vitamin A and D
- c) Vitamin B and D
- d) All of the above

138. Agar is obtained from

- a) Brown algae b) Red algae
- c) Green algae d) Blue-green algae

139. Phenol co-efficient indicates

- a) Efficiency of disinfectant
- b) Dilution of of disinfectant
- c) Purity of disinfectant
- d) Quantity of a disinfectant

140. Differential staining of bacteria spore is related to

- a) Albert's staining

- b) Lugol's staining
- c) Moller's staining
- d) Indian ink preparation

141. Salts of heavy metals used as disinfectants are

- a) Thiomersal
- b) Phenyl mercury nitrate
- c) Mercurochrome
- d) All of the above

142. Subunits of capsid are called

- a) Capsule
- b) Capsomeres
- c) Centromeres
- d) Centrioles

143. Nichrome loop wire is used in which of the following techniques ?

- a) Pour-plate
- b) Streak-plate
- c) Spread-plate
- d) Roll-tube technique

144. In which of the following is a contraindication to immunisation ?

- a) Infantile eczema requiring topical steroids
- b) Oral poliomyelitis vaccine to a child on oral steroids
- c) A history of prolonged jaundice
- d) A child with congenital adrenal hyperplasia on oral cortisone

145. Carrageenan is used as a _____

- a) emulsifier
- b) solidifying agent
- c) binder
- d) emulsifier and binder

146. *Mycobacterium bovis* is also causative agent for 'Tuberculosis' in human and is transmitted by

- a) Cow's milk
- b) Goat's milk
- c) Camel's milk
- d) Poultry

147. The coagulase test is used to differentiate

- a) *Staphylococcus epidermidis* from *Neisseria meningitidis*
- b) *Staphylococcus aureus* from *Staphylococcus epidermidis*
- c) *Streptococcus pyogenes* from *Staphylococcus aureus*
- d) *Streptococcus pyogenes* from *Enterococcus faecalis*

148. Characteristics of a bacterial capsule include

- a) All bacteria have one
- b) It is composed of peptidoglycan

- c) It is an important mechanism for protecting a bacteria against ingestion by PMNs
- d) It is what cause the gram stain reaction

149. Which of the following is true regarding *Rickettsia rickettsii* ?

- a) It is transmitted by ticks
- b) It can be transmitted by flying squirrels
- c) Sheep and cattle are important reservoirs
- d) Highest attack occur in Colorado and Utah

150. Which of the following is not one of Koch's postulates ?

- a) The organism is regularly found in lesions of the disease
- b) The organism can be isolated from diseased tissue in pure culture on artificial media
- c) Inoculation of this pure culture produces a similar disease in experimental animals
- d) Treatment of the disease with a broad spectrum oral antimicrobial dependably eradicates the organism and cures the disease

151. Each of the following statements (except one) is true regarding malaria. Which one is false?

- a) Once someone has malaria infection, they will have it for the rest of their life inspite of treatment.
- b) All persons who contract *P. vivax* malaria have Duffy Antigen present on their red blood cells.
- c) Persons with sickle cell trait or disease are more resistant to serious malaria
- d) Schuffner's dots in red cell cytoplasm are most consistant with *P. vivax* or ovale malaria

152. Most common strain of *E. Coli* giving rise to traveller's diarrhoea is ?

- a) Entero-invasive *E. Coli*
- b) Entero-pathogenic *E. Coli*
- c) Entero-toxigenic *E. Coli*
- d) Entero-aggregative *E. Coli*

153. Which one of the following is not in WHO surveillance ?

- a) Rabies
- b) Influenza
- c) Malaria
- d) Varicella

154. Provision of free medical care to the people at government expense is known as

- a) State medicine
- b) Social therapy
- c) Social medicine

d) Social insurance programme

155. Which of the following is used for the proper maintenance and preservation of pure cultures?

- a) Periodic transfer to fresh media
- b) Preservation by overlaying cultures with mineral oil.
- c) Preservation by lyophilization
- d) All of the above

156. Production of acetoin can be detected by which of the following tests ?

- a) Citrate test
- b) Voges-Proskauer test
- c) Methyl red test
- d) Indole test

157. Quantitative measurement of bacterial growth can be carried out by measuring

- a) Cell count
- b) Cell mass
- c) Cell activity
- d) All of the above

158. All organisms require at least small amounts of carbondioxide. However, some can use CO_2 as their sole source of carbon. Such organisms are termed as

- a) Autotrophs
- b) Phototrophs
- c) Heterotrophs
- d) Chemotrophs

159. What are the extrinsic factors for the microbial growth ?

- a) humidity
- b) storage temperature
- c) composition of gas phase
- d) all of the above

160. Monoclonal antibodies recognize a single

- a) Antigen
- b) Bacterium
- c) Epitope
- d) B cell

161. Which of the following is a differential medium ?

- a) Mac Conkey's agar
- b) Loeffler serum slope
- c) Deoxycholate citrate agar
- d) Alkaline peptone water

162. 'Gangrene' is caused by

- a) *Clostridium botulinum*
- b) *Clostridium tetani*
- c) *Clostridium perfringens*
- d) *Clostridium difficile*

163. Salmonellosis involves

- a) an enterotoxin and exotoxin
- b) an enterotoxin and cytotoxin
- c) an exotoxin and cytotoxin
- d) a cytotoxin only

164. The 'amoebic dysentery' is caused by

- a) *Entamoeba histolytica*
- b) *Giardia lamblia*
- c) *T. tropica*
- d) *T. cruzi*

165. In hospitals, the surgical instruments and plastics are washed with

- a) Ethylene oxide
- b) Iodine
- c) Tincture
- d) Chlorine

166. The method used for the sterilization of solutions is called

- a) Sterilization
- b) Autoclaving
- c) Filtration
- d) Radiations

167. A chemical, used for the removal of microorganisms from the mucous membrane and skin, called as

- a) Detergent
- b) Alcohol
- c) Pesticides
- d) Antiseptics

168. The temperature required for the 'sterilization' with dry heat is

- a) 180°C
- b) 183°C
- c) 189°C
- d) 190°C

169. Sterilization is done by autoclave, consisting exposure to steam, about

- a) 120°C
- b) 170°C
- c) 121°C
- d) 116°C

170. Fermenters are designed for

- a) aerobic processes
- b) anaerobic processes
- c) both aerobic and anaerobic processes
- d) antiseptic process

171. The identification of bacteria by serologic test is based on the presence of specific antigens. Which of the following components is least likely to contain useful antigens ?

- a) Capsule
- b) Flagella
- c) Cell wall
- d) Ribosomes

172. Unicelled microbes grown as source of protein are called

- a) microbial proteins
- b) single cell proteins
- c) unicelled proteins
- d) none of these

173. The treatment of municipal water supplies is based upon

- a) coagulation, filtration, chlorination
- b) filtration, coagulation, chlorination
- c) chlorination, filtration, coagulation
- d) coagulation, chlorination, filtration

174. Application of bioinformatics include

- a) data storage and management
- b) drug designing
- c) understand relationships between organisms
- d) all of the above

175. Macrophages are professional antigen-presenting cells. The protein molecule through which they present antigen in human is

- a) action
- b) interleukin
- c) HLA
- d) CD 8